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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,338	04/05/2005	Anders Granstrom	2380-984	8347

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ARLINGTON, VA 22203

EXAMINER

PATEL, DHAVAL V

ART UNIT	PAPER NUMBER
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2611

MAIL DATE	DELIVERY MODE
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12/07/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/510,338

Applicant(s)

GRANSTROM ET AL.

Examiner

Dhaval V. Patel

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-4, 6-8, 12-14 and 16 is/are rejected.
7) ☒ Claim(s) 5, 9-11, 15 and 17-33 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 05 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/5/2004.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows: (*See MPEP Ch. 2141*)

- a. Determining the scope and contents of the prior art;
 - b. Ascertaining the differences between the prior art and the claims in issue;
 - c. Resolving the level of ordinary skill in the pertinent art; and
 - d. Evaluating evidence of secondary considerations for indicating obviousness or nonobviousness.
2. Claims 1-4, 6-8, 12-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heidman et al. (US 6,799,020) (hereafter Heidman) in view of Daly et al. (US 6,748,021) (hereafter Daly).

Regarding claims 1 and 14, Heidman discloses transmitter method and arrangement, comprising:

a first modulation unit (Fig. 1a, 126A) having a first digital signal processor (Fig. 1a, digital gain, 106a, col. 4 lines 51-56 discloses performing gain function in digital signal processors) and a first analogue signal generator (Fig. 1a, digital to analog converter, 108A);

said first digital signal processor (Fig. 106a) having a first digital signal input (Fig. 1a, digital input from 102A)

a first power amplifier (Fig. 1a, HPA, 112a), connected to an output of said first analogue signal generator (Fig. 1a, DAC, 108A)

a second modulation unit (Fig. 1a, second modulation through second branch) having a second digital signal processor (Fig. 1a, digital gain, 106b) and a second analogue signal generator (Fig. 1a, DAC, 108b)

said second digital signal processor (Fig. 1a, digital gain, 106a) having a second digital signal input (Fig. 1a, digital input through 102b)

a second power amplifier (Fig. 1a, HPA, 112b) connected to an output of said second analogue signal generator (Fig. 1a, DAC, 108b)

combiner device (Fig. 1a, combiner, 120) connected to outputs of said first (Fig. 1a, power amplifier, 112a) and second power amplifiers (Fig. 1a, power amplifier, 112b)

and transmitter device (Fig. 1a, transmitting antenna, 122) connected to an output of said combiner device (Fig. 1a, combiner, 120)

However, Heidman is silent about said first digital signal processor further comprises : at least one first non-constant envelope modulation means; a first signal component separator connected to an output of said at least one first non-constant envelope modulation means; a first output of said first signal component separator being connectable to said first analogue signal generator; first means for receiving modulation instructions; at least one first constant envelope modulation means connectable to said first analogue signal generator; and first modulation selecting

means for connecting a modulation means to said first digital signal input -in response to received modulation instructions.

in the same field of endeavor, Daly teaches at least one non-constant envelope modulation means (Fig. 10, QPSK), Also, Daly teaches within the same section (108) the signal separation into the in phase (I) and Quadrature (Q) components. Daly further teaches modulation selection signal (construed as control signal) to select the modulation scheme like QPSK (112), 16QAM (110) and GMSK (114) (QPSK is non-constant envelope signal while GMSK is constant envelope signal) using the switch (116a). Digital to analog converter is the inherent component of the wireless communication where digital signal is modulated signal and converted into analog form before transmitted through transmitting antennas, so the means for converting the digital to analog signal must be there.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to incorporate such components for selecting the modulation schemes, as taught by Daly, into the system of Heidman, as a whole, so as to choose (based upon modulation selection instruction) the modulation scheme either from non constant envelope or constant envelope for processing the digital signal and separating the modulated signal into the in phase and quadrature phase components, the motivation is to provide an improved communication system which uses adaptive modulation and optimized the data rates (col. 2 lines 59-62).

Regarding claim 2, the combined teachings of both Heidman and Daly discloses same limitations since Daly's method to select modulation and separate into in phase and quadrature phase components can be used in Heidman's transmitter arrangements with multiple parallel processors and digital to analog converters and power amplifiers.

Furthermore, Heidman discloses combining or summing the signal from multiple processors (Fig. 1a, combiner, 120).

Regarding claim 3, the combined teachings of both Heidman and Daly discloses the transmitter arrangement wherein a second output of said first signal component separator (Daly, Fig. 10, quadrature phase component, 108) being connectable to said second analogue signal generator (Heidman, Fig. 1a, 108B).

Regarding claim 4, claim is rejected on the same basis for claim 1 is rejected. Claim 4 is similar except refer to second digital signal processor and the combined teachings of both Heidman and Daly already established that the Daly's modulation selecting means after receiving control instructions can be used into the transmitter arrangement of Heidman with multiple parallel processes and combining.

Regarding claim 6, Heidman further discloses the transmitter arrangement further comprising: first power monitor sensing (Fig. 1a, power meter, 118) a total power to said transmitter device (Fig. 1a, 126) or a quantity directly related thereto; and phase-shifter (Fig. 1a, DDS, 104a) connected to said first power monitor (Fig. 1a, power control

module, 116), arranged for causing a phase shift of an analogue signal generated by said first analogue signal generator (Fig. 1a, DAC, 108a) in response to said sensed total power (Fig. 1a, power meter, 118 sense total power from combiner (120)).

Regarding claim 7, Heiman further discloses the transmitter arrangement according to claim 6, wherein said first power monitor (Fig. 1a, control module, 116) is a power meter (Fig. 1a, power meter, 118) of a load of said combiner device (Fig. 1a, combiner, 120).

Regarding claim 8, Heidman further discloses the transmitter arrangement wherein said phase-shifter (Fig. 1a, 102a controlled by digital synthesizer, 104a) comprises means for complex multiplication of said phase shift (Fig. 1a, 104a) with a digital signal to be inputted to said analogue signal generator (Fig. 1a, DAC, 108a).

Regarding claim 12, Heidman discloses the transmitter arrangement according to claim 1, means for combination of at least two carriers (Fig. 1a, combiner 120), However, Heidman is silent about the method wherein that said first and second non-constant envelope modulation means are selected from the list of: 4-PSK modulation means; 8-PSK modulation means; and means for combination of at least two carriers.

However, one skilled in the art would know that there are various type of modulation types within which PSK modulation has different modulation schemes like 4-PSK, 8-PSK etc.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to select the PSK modulation from either 4-PSK or 8-PSK modulation scheme, so as to transmit more bits per symbol, in order to achieve higher data rate.

Regarding claim 13, Heidman is silent about the transmitter arrangement wherein said first and second constant envelope modulation means are GMSK modulation means.

However, Daly, in the same field of endeavor, teaches GMSK modulation means as one of the selecting means (Fig. 10, GMSK, 114)

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine teachings of both Heidman and Daly, as a whole, so as to use GMSK as constant envelope modulation, to provide higher data rates.

Regarding claim 16, claim 16 is rejected on the same basis claims 1 and 2 are rejected.

Allowable Subject Matter

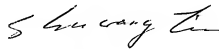
3. Claims 5, 9-11, 15, 17-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patel Dhaval whose telephone number is (571) 270-1818. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. Customer Service can be reached at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Dhaval Patel
12/6/2007

SHUWANG LIU
SUPERVISORY PATENT EXAMINER